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Docket No.: 217522US0PCT

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

RE: Application Serial No.: 10/019,283

Applicants: Tadahiko FURUTA, et al.

Filing Date: January 2, 2002

For: TITANIUM ALLOY MEMBER AND PROCESS FOR
PRODUCING THE SAME

Group Art Unit: 1742

Examiner: J. SHEEHAN

SIR:

Attached hereto for filing are the following papers:

Declaration Under 37 C.F.R. §1.132 as filed 11/28/2003 (5 pp., executed original copy)

Our check in the amount of **\$0.00** is attached covering any required fees. In the event any variance exists between the amount enclosed and the Patent Office charges for filing the above-noted documents, including any fees required under 37 C.F.R. 1.136 for any necessary Extension of Time to make the filing of the attached documents timely, please charge or credit the difference to our Deposit Account No. 15-0030. Further, if these papers are not considered timely filed, then a petition is hereby made under 37 C.F.R. 1.136 for the necessary extension of time. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

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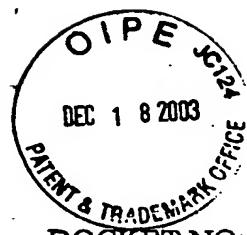
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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF

TADAHIKO FURUTA, ET AL.

: EXAMINER: SHEEHAN, J.

SERIAL NO: 10/019,283

: GROUP ART UNIT: 1742

FILED: JANUARY 2, 2002

FOR: TITANIUM ALLOY MEMBER AND
PROCESS FOR PRODUCING THE SAME

DECLARATION UNDER 37 C.F.R. 1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313-1450

SIR:

I, Tadahiko FURUTA, a citizen of Japan, hereby declare and state that:

1. I graduated from Suzuka College of Technology in 1982.

2. I have been employed by Kabushiki Kaisha Toyota Chuo Kenkyusho since 1982,

where I have been engaged in materials science and engineering.

3. The following experiments were carried out by me or under my direct control to compare Inventive Sample No. A (Ti-30Nb-10Ta-5Zr including 0.26 wt% O) with Comparative Sample Φ (sample No. TA22 (Ti-35.3Nb-4.9Ta-7.2Zr) of U.S. Patent No. 5,871,595 ("Ahmed!").

Experimental Method

4. Samples were produced by a powder metallurgy method using raw powders of Ti, manufactured by TOHO TITANIUM (TC459 (#350)), and of Nb, Ta, and Zr, manufactured by KOUJUNDOKAGAKU (#350). To form Comparative Sample ①, Ti, Nb, Ta and Zr powders were first mixed to form a mixed powder. Each mixed powder was fully agitated by a shaker and then subjected to rotational mixing in a rotational ball mill mixing vessel for 2 hours. After that the mixed powder was filled in a silicon rubber mold and compacted by a CIP pressing machine at a pressure of 4 ton/cm². Then sintering was carried out in a vacuum of 10^{-5} torr at 1300°C × 16 hours. After the sintering, hot forging was carried out at 1050°C. After carrying out a solution heat treatment at 900°C for 30 minutes, cold working with 90% reduction in area was carried out, and then a test piece having a plane portion of 2mm × 10mm was prepared. Each test piece was subjected to a tensile test at room temperature. The tensile test was carried out by using an Instron universal testing machine at an early strain rate of 5×10^{-4} /sec. Young's modulus was estimated by attaching a strain gage to each test piece. Comparative Sample ① had an oxygen amount of not more than 0.2%.

Results of Comparative Experiments

5. The attached FIGS. A-B compare Inventive Sample No. A with Comparative Sample ① (i.e., Ahmed's TA22 (Ti-35.3Nb-4.9Ta-7.2Zr) alloy).

6. FIG. A shows that Comparative Sample ① has a tensile strength of 590MPa, a tensile elastic limit-strength (0.2% proof stress) of 530MPa, a Young's modulus of 55GPa, and an elastic deformation of approximately 1%. The tensile elastic limit strength of Comparative Sample ① is significantly lower than that of Inventive Sample No. A.

7. FIG. B magnifies the low strain region of FIG. A to highlight the low strain differences between Inventive Sample No. A and Comparative Sample O. Up to approximately 0.7% strain, the stress-strain curve for Comparative Sample O remains linear (no deviation from a straight line). In contrast, at low strain the stress-strain curve for Inventive Sample No. A is non-linear (sight down the curve).

8. Because at low strain the stress-strain curves for Comparative Sample O is linear while the stress-strain curve for Inventive Sample No. A is non-linear, the stress-strain curve for Comparative Sample O is qualitatively and significantly different than the stress-strain curve of Inventive Sample No. A.

9. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

10. Further declarant saith not.

Date: Nov. 25, 2003

Tadahiko Furuta

Tadahiko FURUTA

Attachments:

FIGS. A and B